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Method of and apparatus for securing an article to a container.

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A method and an apparatus for heat-bonding, such as gluing or welding, a succession of first articles, such as drinking straws, to a succession of second articles, such as beverage containers, is disclosed, wherein said first articles are held by gripping means (3,3a) of a first conveyor (1) and moved along a first conveying path and pressed against the surfaces of the second articles moving along a second conveying path (17) and wherein electrical heating means (6) associated with the holding means are temporally contacting with the stationary electrical contact rails (10,11) for supplying current to the heating means for temporally heating the first articles whilst they are pressed against the surface of the second articles.

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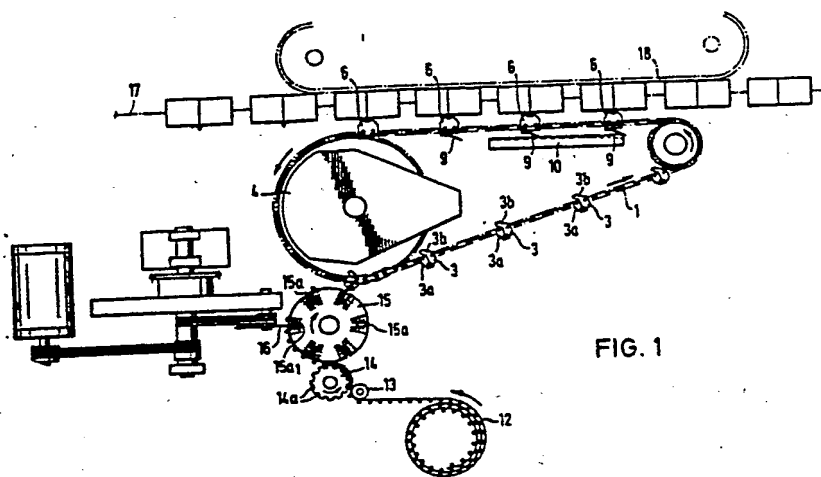


FIG. 1

- 1 - **TITLE MODIFIED**
see front page

~~A method and apparatus for heat-bonding a first article,
such as drinking straw, to a surface of a second article,
such as a beverage container~~

The invention relates to a method and an apparatus for head-bonding, such as gluing or welding, of a first packaged article, such as a drinking straw or the like, to a surface of a second article, such as a beverage container or the like.

It is an object of the invention to provide a method for continuously applying a succession of said first articles to a succession of said second articles while these are conveyed along a conveying path. It is a further object of the invention to provide an economic, reliable and effective apparatus for carrying out such method.

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According to the invention a method for head-bonding a first article to a second article is characterized in that the first articles are successively fed along a first conveying path by holding means and pressed by the holding means against the surface of second articles moving along a second conveying path parallel to said first conveying path, that at least part of each said first article and/or said surface of the second article is made of or coated with a heat-meltable and then adhesive material, and that heat is applied temporarily to said first articles via said holding means whilst the first articles are moved along the conveying path and pressed against the second articles.

15 An apparatus for performing this method according to the invention is characterized by a first conveyor having spaced gripping means each for holding a first article, electrical heating means associated with each gripping means for contacting a first article held by said gripping means, a second conveyor for said second articles, said first and second conveyors forming side by side conveying path over part of their length, and stationary electrical contact rails connected to a source of electric current and

extending over part of said conveying path for being contacted by contact means of said heating means when said gripping are moving along said conveying pass.

A preferred embodiment of the invention will be described in detail with reference to the drawings.
In the drawings

fig. 1 is a general plan view of a conveying and bonding means according to an embodiment of the invention;

10 fig. 2 is an enlarged perspective view partially taken from the back of fig. 1;

fig. 3 is an enlarged plan view of a heater part, partially illustrating it in a cutaway manner;

15 fig. 4 is a perspective view of a package containing a straw with 2 films; and

fig. 5 is a perspective view of a state in which said package is fitted up to a container.

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A paper container, so-called pack container as shown in fig. 5, is used as a container for containing fruit juice or the like

While there are many cases where a straw is
5 fitted to such a container A, when fruit juice or the like contained therein is on sale, said straw is packed with 2 strips of film for sanitary reasons as shown in fig. 4. After gluing the packed straw to a side wall of the container A as shown in fig. 5, the fruit juice
10 or the like contained therein is placed on sale.

For the purpose of such gluing, melt-welding and hot gluing technology by special bonding agent can be utilized. In performing this gluing work, an extremely efficient method lies in the process in which, when
15 a package C as shown in fig. 4 is conveyed so as to make an access to the container A which is forwarded through another course, such gluing work is arranged to be carried out.

A pair of long pins 2 and 2a is mounted on links
20 1a and 1a of a pair up-and-down endless chains 1 and 1.
A holding device is fixed at the central part of hight-wise direction of said pair of pins.

The holding device consists of two holding pieces 3 and 3a. One holding piece 3a is fixed to the pin 2a, another holding piece 3 is rotatably fitted up to the pin 2. A projecting piece 3b is formed on the holding piece 3. When said projecting piece 3b coincides with guide 4 provided within the chain (fig. 1), the holding piece 3 swings in regard to the holding piece 3a, as if a mouth is opened, thereby making it easy to hold the package C therein and, on the contrary, when such coincidence does not occur, the above-mentioned two holding pieces 3 and 3a are closed together so that it is possible to hold the package C therein. The joint surface of both holding pieces 3 and 3a is notched to form groove 5, in which an expanded part C_3 of the package C is preferably adapted to be grasped.

At the upper and lower sides of the above-mentioned holding pieces 3 and 3a a pair of pins 2 and 2a is equipped with heater bases 6 and 6, respectively. Each of said heater bases 6 and 6 is equipped with a heater 7 in a manner, that the partial part of the heater 7 extrudes from the outer side of the heater base 6. (Namely, the partial parts of the heaters 7 and 7 are located toward the front of fig. 2 and they are on the right of the heater base 6 in fig. 3).

At the position corresponding to the groove 5 notched between the above-mentioned holding pieces 3 and 3a a groove is disposed between the heaters 7 and 7 extruding from the outer side of the heater base 6, 5 whereby the expanded part C_3 of the package C, whose central part is put between the holding pieces 3 and 3a, is set in said groove 8.

The back of the upper heater base 6 is equipped with pair of upper and lower contact segments 9, whose 10 tips are respectively contacted with each of a conductor rails 11 and rail 10 provided within chain 11. With such a composition the upper and lower heaters 7 and 7 make an electrical connection, thereby carrying electricity from outside to the heater.

15 With regard to other numerical symbols illustrated by the drawings, 12 is a long strip of article continuing the package C in a longitudinal direction of fig. 4.

13 is a hold-down roller. 14 is a feed roller which 20 performs an intermittent rotation in a counterclockwise direction of fig. 1, when signal is given thereto, whereby the long strip of article 12 can be fed out 1 pitch

at a time (namely, the distance between a straw and a successive straw in the long strip of article 12.) A plurality of grooves 14a are longitudinally (vertically) provided at regular intervals on the periphery of said feed roller 14. The expanded parts C_3 of the long strip of article 12 are one by one housed in each of said grooves 14a.

15 is a cutting rotor which, located outside the feed roller 14, is provided near to the above-mentioned chain 11. The periphery of the cutting rotor 15 is longitudinally (vertically) provided at regular intervals with notched grooves 15a, of which front and rear peripheries are adapted to be acted on by a vacuum force. The cutting rotor 15 and the feed roller 14 are synchronously rotated.

16 is a cutter which rotates on its axis, while vertically revolving and plays the role of cutting the long strip of article 12 held by vacuum on the periphery of the cutting rotor 15 into the packages C as shown in fig. 4. The separated packages C, which are still held by vacuum on the periphery of the cutting rotor 15, are forwarded near to the chain 1 by the rotation thereof.

17 is a conveyor for carrying the containers A which is installed in parallel to the chain 1, travelling at the same speed as that of chain 1. The containers A are carried by the conveyor in a manner that
5 an upper corner's ridge part thereof, shown as a in fig. 5 is positioned right overhead. 18 is a guide which is provided outside the conveyor 17.

When each of the packages C, cut off from the long strip of article 12 by the cutter 16 as shown in
10 fig. 4, which is still held by vacuum on the periphery of the cutting rotor 15, is forwarded near to the chain 1 by the rotation thereof, one holding piece 3 composing the holding device fitted to the chain 1 travelling at the fixed speed straddles and
15 the holding device makes an access to the periphery of cutting rotor 15 similar to the condition of a mouth being opened. After that, as the projecting part 3b of the holding piece 3 comes off the guide 4, the legs of the holding device close, thereby putting
20 the package C held by vacuum on the periphery of the cutting rotor 15 between them. At that time, the expanded part C_3 of the package C is grasped in the groove 5 of the holding device and the grooves 8 and 8 of the up-and-down heater bases 6.

The package C put between the two pieces of the holding device is forwarded in an arrow direction as shown in fig. 1 by the travelling of the chain and, subsequently, reaches a position to touch the side wall of the container A, which is carried by the conveyor 17, so that said package C, still pressed against the side of the guide 18 by the holding device, is transferred together with the container A to the left direction on fig. 1.

10 When the holding device is travelling along the side of the rail 10, the contact segments 9 are respectively by each of the conductor rails 11, thereby carrying electricity from outside to the up-and-down heaters 7 and 7. As a result the electricity is turned
15 on to each of the heaters; while the holding device is travelling along the side of the rail 10, a contact bonding and melt-welding of the package to the side wall of the container are performed at the parts shown as D in fig. 5 on both of the side edges C_4 and C_4 of
20 said package C.

Thus, the package C is fitted up to the side wall of the container A in a diagonal direction.

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Since the chain 1 and the conveyor 17 continue to be driven without cease, the projecting piece 3b of one holding piece 3 composing the holding device comes to coincide with the guide 4 in due course of time. At
5 this moment the holding piece 3 straddles as if a mouth is opened. For this reason the package C is released from the holding device and the container A to which said package C has been fitted up moves directly to the left side of fig. 1 by the conveyor 1.

10 Similarly to the above-mentioned case, the subsequent holding device conveys the following package, which is forwarded, while being still held by vacuum to the periphery of the cutting rotor 15, to the welding process and said package C is melt-welded to the
15 side wall of the container which is subsequently forwarded.

A repetition of this operation enables the conveyed packages as shown in fig. 4 to be glued one by one to the side wall of the container A which is
20 forwarded from a different course.

According to the present invention, there is an effect of improving the working efficiency, because

while an article to be glued, for example the package as shown in fig. 4, and an article to which said package is glued are being transferred to each other, said package can be glued to the latter article.

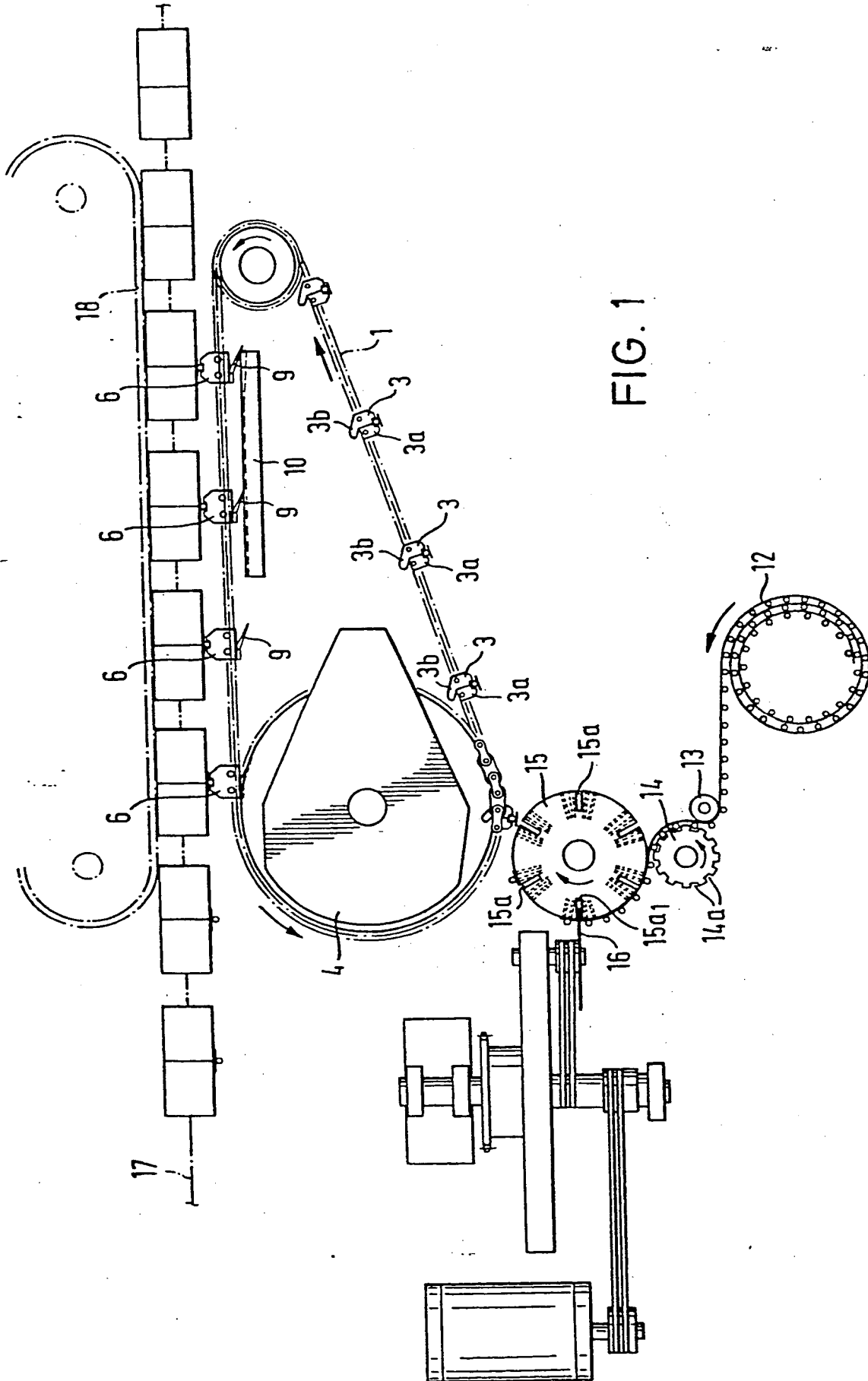
5 The above-mentioned embodiment illustrates the case where the article to be glued is the package

containing a straw, whereas the article to which said package is glued is the paper container into which is poured the fruit juice or the like, but the present
10 invention is not restricted to such a case. Needless to say, the embodiment illustrates the case where bonding is performed by melt-welding, but the present invention can be also brought into a practical work in which hot gluing is performed by using
15 a special bonding agent.

C l a i m s

1. A method for heat-bonding a first article, such as a drinking straw, to a surface of a second article, such as a beverage container, characterized in that the first articles are successively fed along a first conveying path by holding means and pressed against the surfaces of the second articles moving along a second conveying path parallel to the first conveying path, that at least part of each said first article and/or said surface of the second article is made of or coated with a heat-meltable and then adhesive material, and that heat is applied temporarily to said first articles via said holding means whilst being pressed against said surfaces of the second articles.
2. An apparatus for carrying out the method according to claim 1, characterized by a first conveyor having gripping means (3, 3a) each for holding a first article C, electrical heating means (6, 7) associated to each gripping means (3, 3a) and in contact with said first article C held in the gripping means, a second conveyor (17) for the second articles A, said first and second conveyors (1, 17) forming a side by side

conveying path, and stationary electrical contact rails (10) connected to a source of electrical current and extending over part of said conveying pass for being contacted by contact means (9) of said heating means (6, 7) when said gripping means the (3, 3a) are moving along/conveying path.



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FIG. 2

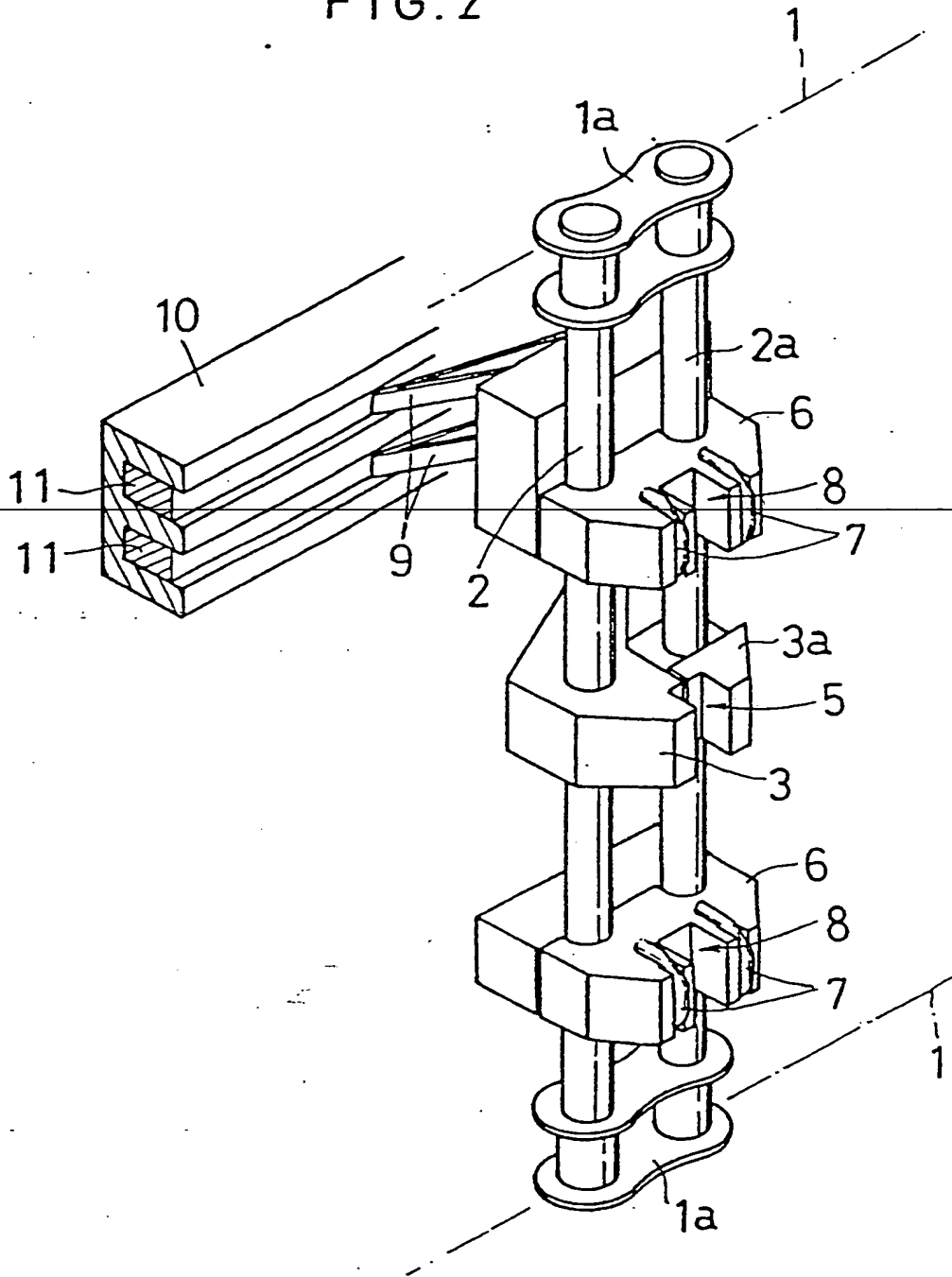


FIG. 3

FIG. 4

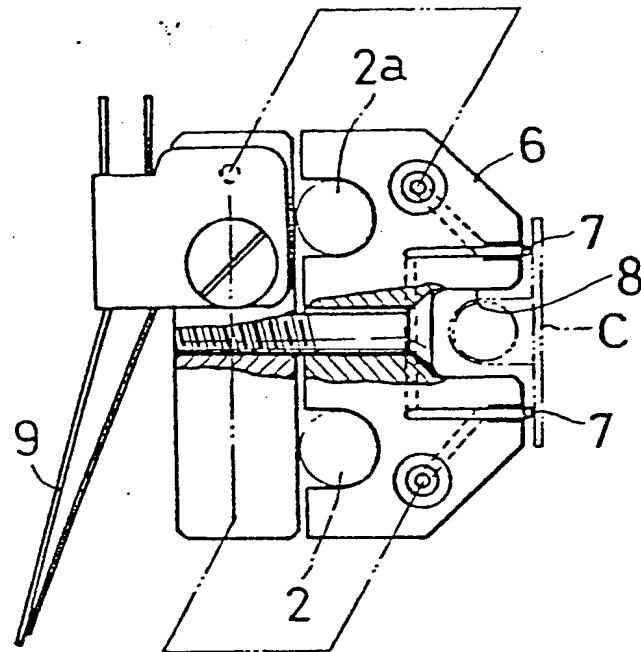
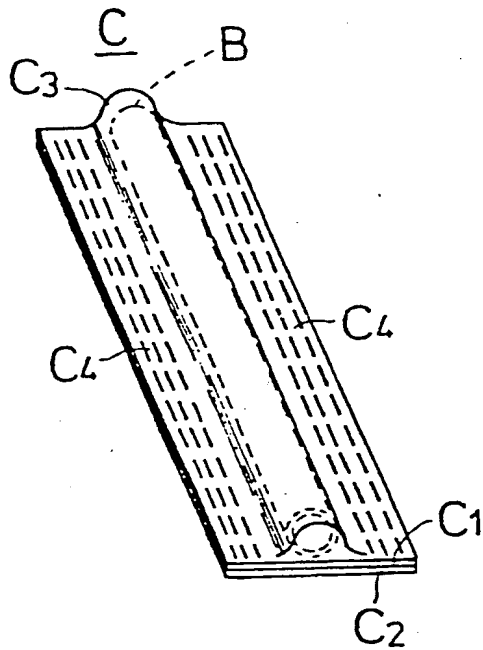
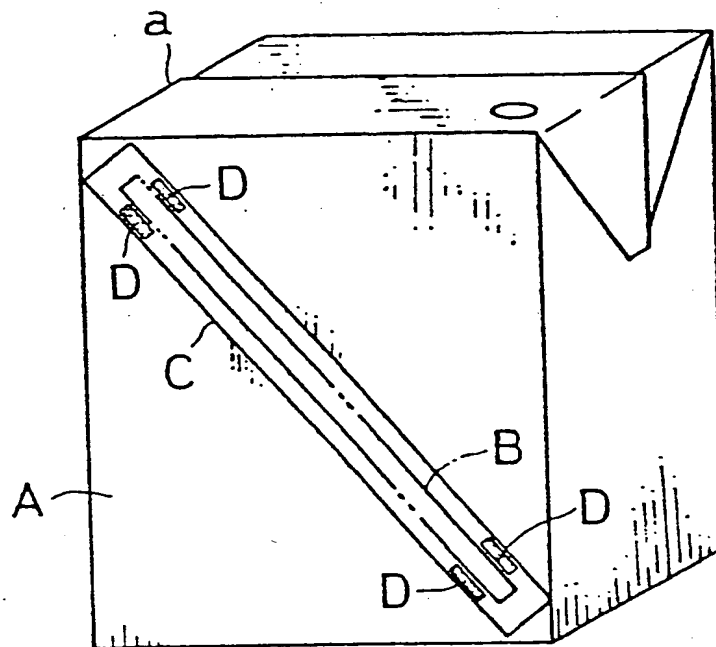


FIG. 5





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EUROPEAN SEARCH REPORT

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Application number

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DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	<u>GB - A - 2 013 606</u> (TETRA PAK) -----		B 65 B 15/00
			TECHNICAL FIELDS SEARCHED (Int. Cl.)
			B 65 B 15/00 B 65 B 61/00
			CATEGORY OF CITED DOCUMENTS
			X: particularly relevant A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: conflicting application D: document cited in the application L: citation for other reasons
X	The present search report has been drawn up for all claims		&: member of the same patent family, corresponding document
Place of search VIENNA		Date of completion of the search 28-04-1981	Examiner MELZER

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